<u>IN THE CLAIMS</u>

1. - 13.   (cancelled)

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14.   (previously added)   A method of determining the critical current of a conductor

including superconducting material, the method comprising

    - bringing said conductor into a superconducting state,

    - conveying said conductor through a varying external magnetic field,

    - carrying out, by means of a first measurement means, a first contact-free

measurement of a resulting magnetic field, the resulting magnetic field occurring as a

consequence of the influence of said external magnetic field on the conductor,

    - determining a part of the resulting magnetic field out of phase with the external

magnetic field, and

    - determining the critical current of the conductor from the determined part of the

resulting magnetic field out of phase with the external magnetic field.

15.   (previously added)   A method according to claim 14, wherein the step of carrying

out the first contact-free measurement of the resulting magnetic field comprises carrying out

the first contact-free measurement from a first side in relation to the conductor; and wherein

the method further comprises carrying out a second measurement of the resulting magnetic

field from a second side, opposite to the first side, in relation to the conductor using a second

measurement means; and the method further comprises determining, from said first

measurement, or any value derived therefrom, and from said second measurement, or any

value derived therefrom, a corrected field value of the resulting magnetic field, the corrected

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field value being compensated for measurement variations that occur as a consequence of variations in distance between conductor and measurement means.

16.   (previously added)   A method according to claim 15, wherein the step of determining a corrected field value comprises determining a corrected field value U by means of the formula $U=((A+B)-k(A-B)^2)/2$, wherein the value A is the field value from said first measurement or a value derived therefrom, and wherein the value B is the field value of said second measurement or a value derived therefrom.

17.   (previously added)   An apparatus for determining the critical current of a conductor including a superconducting material, the apparatus comprising

    - a conveyor arranged to convey the conductor through the apparatus,

    - a cryostat arranged to cool the conductor and to make it reach a superconducting state,

    - a field generation device arranged to generate a varying external magnetic field through which the conductor is conveyed, and

    - a first measurement means arranged to carry out a measurement of the resulting magnetic field that occurs as a consequence of the influence of said external magnetic field on said conductor;

wherein the apparatus is arranged to determine a part of the resulting magnetic field out of phase with the external magnetic field, and to determine the critical current of the conductor on the basis of the determined part of the resulting magnetic field out of phase with the external magnetic field.

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18.   (previously added)   An apparatus according to claim 17, wherein the field generating device comprises Helmholtz coils.

19.   (previously added)   An apparatus according to claim 17, wherein said first measurement means is arranged to carry out a measurement of the resulting magnetic field from a first side in relation to the conductor; wherein the apparatus further comprises a second measurement means arranged to carry out a measurement of the resulting magnetic field from a second side, opposite to the first side, in relation to the conductor; and wherein the apparatus is further arranged to determine, on the basis of measurements from said first and said second measurement means or values derived therefrom, a connected field value of the resulting magnetic field, the corrected field value being compensated for measurement variations due to the distance between conductor and measurement means.

20.   (previously added)   An apparatus according to claim 19, further arranged to determine a corrected field value U using the formula $U=((A+B)-k(A-B)^2)/2$, on the basis of said measured field value A from said first measurement means or any value derived therefrom, and on the basis of the measured field value B from said second measurement means or any value derived therefrom.

21.   (previously added)   An apparatus according to claim 17, wherein said cryostat comprises a mechanical control device for controlling the conveyance of the conductor through the cryostat, and that said cryostat is arranged to contain a coolant for cooling the conductor.

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22. (previously added)   An apparatus according to claim 8, wherein said control device comprises two separate guides between which the conductor is freely suspended, and that said field generating device and measurement device are arranged between the two guides.

23. (previously added)   An apparatus according to claim 8, wherein said control device comprises two slide guides.

24. (previously added)   An apparatus according to claim 10, wherein said guides are made of high density polyethylene.

25. (previously added)   A method of determining a critical current of a conductor at least including superconducting material, the method comprising:

bringing a conductor at least including a superconducting material into a superconducting state;

relatively conveying the conductor through a varying external magnetic field;

carrying out with first measurement means a first contact-free measurement of a magnetic field resulting as a consequence of the influence of the external magnetic field on the conductor;

determining a part of the first contact-free measurement of the resulting magnetic field that is out of phase with the external magnetic field; and

determining a critical current of the conductor from the determined part of the resulting magnetic field out of phase with the external magnetic field.

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26.   (currently amended)   A method of determining a critical current of a conductor at least including superconducting material, the method comprising:

bringing a conductor at least including a superconducting material into a superconducting state;

relatively conveying the conductor through a varying external magnetic field;

carrying out with first measurement means a first contact-free measurement of a magnetic field resulting as a consequence of the influence of the external magnetic field on the conductor, wherein carrying out the first contact-free measurement of the resulting magnetic field comprises carrying out the same from a first side of the conductor;

carrying out a second contact-free measurement of the resulting magnetic field from a second, opposite side of the conductor, and

determining from the first contact-free measurement or a value derived therefrom and from the second contact-free measurement or a value derived therefrom a corrected field value of the resulting magnetic field, the corrected field value being compensated for measurement variations that occur as a consequence of variations in distance between the conductor and measurement means;

determining a part of the ~~first contact-free measurement of the resulting magnetic~~ corrected field value that is out of phase with the external magnetic field; and

determining a critical current of the conductor from the determined part of the corrected field value ~~resulting magnetic field out of phase with the external magnetic field~~.

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27. (previously added)   A method according to claim 26, wherein the determining of the corrected field value comprises determining the corrected field value U by means of the formula $U=((A+B)-k(A-B)^2)/2$, wherein A is the first contact-free measurement or a value derived therefrom, and B is the second contact-free measurement or a value derived therefrom.

28. (previously added)   An apparatus for determining the critical current of a conductor including a superconducting material, the apparatus comprising:

a field generation device for generating a varying magnetic field;

a conveyor for conveying a conductor through the varying magnetic field;

a cryostat for cooling as conveyed through the the conductor in a superconducting state;

a first measurement means for measuring a magnetic field resulting as a consequence of influence of the varying magnetic field on the conductor;

means for determining a part of the resulting magnetic field out of phase with the varying magnetic field; and

means for determining a critical current of the conductor on the basis of the determined part of the resulting magnetic field out of phase with the external magnetic field.

29. (previously added)   An apparatus according to claim 4, wherein the field generating device comprises Helmholtz coils.

30. (previously added) An apparatus according to claim 28, wherein the cryostat comprises a mechanical control device for controlling the conveying of the conductor through the cryostat, and the cryostat is arranged to contain a coolant for cooling the conductor.

31. (previously added) An apparatus according to claim 30, wherein the control device comprises two separate guides between which the conductor is freely suspended, and the field generating device and measurement device are between the two guides.

32. (previously added) An apparatus according to claim 30, wherein at least one of the guides comprises a slide guide.

33. (previously added) An apparatus according to claim 32, wherein the slide guide comprises high density polyethylene.